

**IN THE CLAIMS**

Please amend the claims as follows:

1. (Currently Amended) A gate position sensor, comprising:
- a transmitter for transmitting a signal in a flow controller, wherein a position of a gate in the flow controller affects the signal; and
  - a receiver for receiving the signal, wherein the receiver is adapted to provide a signal output for the sensor to indicate a gate position within the flow controller based on the signal received, wherein the transmitter is a device for applying electric potential across the gate and an orifice in the flow controller, the signal is electric current flowing through a junction formed by the orifice and the gate formed when the gate is closed, and the receiver is a current detector for detecting current flowing through the junction.

Claims 2-5. (Canceled)

6. (Original) A gate position sensor for a flow controller having an orifice and a gate for closing the orifice, comprising:
- a device for applying an electrical potential across the orifice and the gate; and
  - a current detector for detecting current flowing through a junction formed by the orifice and the gate when the gate is closed.

Claims 7-14. (Canceled)

15. (Currently Amended) A system, comprising:
- an inflow line;
  - a flow controller positioned in the inflow line for controlling flow, the flow controller including a gate and an actuator for moving the gate to control flow;
  - a gate position sensor for monitoring whether the gate is in an opened position or a closed position, the sensor including means for transmitting a signal in the flow controller such that a

position of the gate in the flow controller affects the signal, and means for receiving the signal and providing a signal output for the sensor to indicate a gate position within the flow controller based on the signal received; and

a processor for controlling the position of the gate and for interfacing with the sensor,  
wherein the sensor includes a device for applying an electrical potential across an orifice and the gate in the flow controller, and further includes a current detector, wherein a current flows through a junction formed by the orifice and the gate when the gate is closed, and wherein the current detector detects the current flow through the junction.

Claims 16-19. (Canceled)

20. (Original) The system of claim 15, wherein:  
the system includes a processing chamber;  
the inflow line includes a gas line coupled to the processing chamber;  
the flow controller includes:  
an orifice;  
a gate for controlling gas flow through the orifice; and  
an actuator for oscillating the gate between an opened position and a closed position to control gas flow.
21. (Previously Presented) A semiconductor manufacturing system, comprising:  
an ultrasonic semiconductor gas line;  
a processing chamber coupled to the gas line;  
a flow controller positioned in the gas line, wherein the flow controller further includes:  
an orifice;  
a gate for controlling gas flow through the orifice and into the processing chamber;  
an actuator for oscillating the gate between an opened position and a closed position to control gas flow;  
a transmitter for transmitting a signal in the flow controller; and

a receiver for receiving the signal such that the receiver provides an indication of whether the gate is in an opened position or a closed position based on the signal received; and

a processor for interfacing with the actuator, the transmitter and the receiver to control the position of the gate.

22. (Original) The semiconductor manufacturing system of claim 21, wherein the transmitter is a device for applying electric potential across the gate and an orifice in the flow controller, the signal is electric current flowing through a junction formed by the orifice and the gate when the gate is closed, and the receiver is a current detector for detecting current flowing through the orifice / gate junction.

23. (Withdrawn) The semiconductor manufacturing system of claim 21, wherein the transmitter is a physical wave generator, the signal is a physical wave propagating through a junction formed by the orifice and the gate when the gate is closed, and the receiver is a physical wave receiver for detecting the physical wave propagating through the junction.

24. (Withdrawn) The semiconductor manufacturing system of claim 21, wherein the transmitter is a light source, the signal is a light signal transmitted by the light source, and the receiver is a light detector such that movement of the gate oscillating between an opened position and a closed position interrupts the light signal from being received by the light detector.

25. (Withdrawn) The semiconductor manufacturing system of claim 21, wherein the transmitter is a magnet, the signal is magnetic flux from the magnet, and the receiver is a combination of a cooperating induction coil and an electromagnetic pulse detector for detecting a magnetically induced signal in the induction coil, wherein the magnet and the cooperating induction coil are operably positioned with respect to the gate such that a movement of the gate induces the magnetically induced signal in the induction coil by providing relative movement between the magnet and the coil.

## Claims 26-38. (Canceled)

## 39. (Previously Presented) A gate position sensor, comprising:

a transmitter for transmitting a signal in a flow controller, wherein a position of a gate in the flow controller affects the signal; and

a receiver for receiving the signal, wherein the receiver provides an indication of a gate position within the flow controller based on the signal received,

wherein the transmitter is a device for applying electric potential across the gate and an orifice in the flow controller, the signal is electric current flowing through a junction formed by the orifice and the gate formed when the gate is closed, and the receiver is a current detector for detecting current flowing through the junction.

## 40. (Previously Presented) A system, comprising:

an inflow line;

a flow controller positioned in the inflow line for controlling flow, the flow controller including a gate and an actuator for moving the gate to control flow;

a gate position sensor for monitoring whether the gate is in an opened position or a closed position, the sensor including means for transmitting a signal in the flow controller such that a position of the gate in the flow controller affects the signal, and means for receiving the signal and providing an indication of a gate position within the flow controller based on the signal received; and

a processor for controlling the position of the gate and for interfacing with the sensor,

wherein the sensor includes a device for applying an electrical potential across an orifice and the gate in the flow controller, and further includes a current detector, wherein a current flows through a junction formed by the orifice and the gate when the gate is closed, and wherein the current detector detects the current flow through the junction.

## 41. (Currently Amended) A system, comprising:

an inflow line;

a flow controller positioned in the inflow line for controlling flow, the flow controller including a gate and an actuator for moving the gate to control flow;

a gate position sensor for monitoring whether the gate is in an opened position or a closed position, the sensor including means for transmitting a signal in the flow controller such that a position of the gate in the flow controller affects the signal, and means for receiving the signal and providing an indication of a gate position within the flow controller based on the signal received; and

a processor for controlling the position of the gate and for interfacing with the sensor, wherein:

the system includes a processing chamber;

the inflow line includes a gas line coupled to the processing chamber;

the flow controller includes:

an orifice;

a the gate for controlling gas flow through the orifice; and

an actuator for oscillating the gate between an opened position and a closed position to control gas flow,

wherein the sensor includes a device for applying an electrical potential across an orifice and the gate in the flow controller, and further includes a current detector, wherein a current flows through a junction formed by the orifice and the gate when the gate is closed, and wherein the current detector detects the current flow through the junction.

42. (New) The system of claim 41, wherein the flow controller is a ultrasonic mass flow controller.

43. (New) The system of claim 40, wherein the flow controller is a ultrasonic mass flow controller.

44. (New) The sensor of claim 39, wherein the flow controller is a ultrasonic mass flow controller.

45. (New) The system of claim 15, wherein the flow controller is a ultrasonic mass flow controller.

46. (New) The sensor of claim 1, wherein the flow controller is a ultrasonic mass flow controller.